STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Jan 2022

Log No. 21-GP3-014

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # _C406_

Brief Description:

Delete Section C406 (Efficiency Packages) in entirety and replace with Section C406 from the 2018 WSEC-C. This section was completely rewritten in the 2021 WSEC-C.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

For brevity, only replacement language is depicted. The struck language (entire section) has been omitted.

SECTION C406
EFFICIENCY PACKAGES

C406.1 Additional energy efficiency credit requirements. New buildings and changes in space conditioning, change of occupancy and building additions in accordance with Chapter 5 shall comply with sufficient packages from Table C406.1 so as to achieve a minimum number of six credits. Each area shall be permitted to apply for different packages provided all areas in the building comply with the requirement for six credits. Areas included in the same permit within mixed use buildings shall be permitted to demonstrate compliance by an area weighted average number of credits by building occupancy achieving a minimum number of six credits.

Exceptions:

1.Low energy spaces in accordance with Section C402.1.1.1 and equipment buildings in accordance with Section C402.1.2 shall comply with sufficient packages from Table C406.1 to achieve a minimum number of three credits.

2.Building additions that have less than 1,000 square feet of conditioned floor area shall comply with sufficient packages from Table C406.1 to achieve a minimum number of three credits.

C406.1.1 Tenant spaces. Initial tenant improvement shall comply with sufficient packages from Table C406.1 to achieve a minimum number of six credits. In buildings with multiple tenant spaces, each tenant space is permitted to apply for different packages provided all areas in the building comply with the requirement for six credits.

C406.1.1.1 Applicable envelope and on-site renewable energy credits. Where an entire building or building addition complies with Section C406.5, C406.10 or C406.11, under an initial tenant improvement permit, tenant spaces within the building qualify for the number of credits assigned to the occupancy type of the tenant space in accordance with Table C406.1.

TABLE C406.1
EFFICIENCY PACKAGE CREDITS

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
1. More efficient HVAC performance in accordance with Section C406.2	2.0	3.0	3.0	2.0	1.0	2.0
2. Reduced lighting power: Option 1 in accordance with Section C406.3.1	1.0	1.0	2.0	2.0	3.0	2.0
3. Reduced lighting power: Option 2 in accordance with Section C406.3.2a	2.0	3.0	4.0	4.0	6.0	4.0
4. Enhanced lighting controls in accordance with Section C406.4	NA	NA	1.0	1.0	1.0	1.0
5. On-site supply of renewable energy in accordance with C406.5	3.0	3.0	3.0	3.0	3.0	3.0
6. Dedicated outdoor air system in accordance with Section C406.6b	4.0	4.0	4.0	NA	NA	4.0
7. High performance dedicated outdoor air system in accordance with Section C406.7	4.0	4.0	4.0	4.0	4.0	4.0
8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4.0	5.0	NA	NA	NA	8.0
9. High performance service water heating in multi-family buildings in accordance with Section C406.9	7.0	8.0	NA	NA	NA	NA
10. Enhanced envelope performance in accordance with Section C406.10c	3.0	6.0	3.0	3.0	3.0	4.0
11. Reduced air infiltration in accordance with Section C406.11 c	1.0	2.0	1.0	1.0	1.0	1.0
12. Enhanced commercial kitchen equipment in accordance with Section C406.12	5.0	NA	NA	NA	5.0	5.0 (Group A-2 only)

a. Projects using this option may not use Item 2.
b. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.
c. Buildings or building areas that are exempt from thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2 do not qualify for this package.

C406.1.1.2 Applicable HVAC and service water heating credits. Where HVAC and service water heating systems and services are installed and comply with Section C406.2 or C406.8 under an initial tenant improvement permit, those systems and services shall be considered a part of the tenant space. Tenant spaces qualify for the credits assigned to the occupancy type of the tenant space in accordance with Table

C406.1 if the tenant space includes the distribution system and equipment that the central HVAC systems or service water heating systems were designed to support.

Exception: Previously occupied tenant spaces in existing buildings that comply with this code in accordance with Section C501.

C406.2 More efficient HVAC equipment and fan performance. No less than 90 percent of the total HVAC capacity serving the total conditioned floor area of the entire building, or tenant space in accordance with Section C406.1.1, shall comply with Sections C406.2.1 through C406.2.3. For systems required to comply with Section C403.1.1, HVAC total system performance ratio, exceed the minimum requirement by 10 percent.

Exception: In low energy spaces complying with Section C402.1.1 and semi-heated spaces complying with Section C402.1.1.2, no less than 90 percent of the installed heating capacity is provided by electric infrared or gas-fired radiant heating equipment for localized heating applications. Stand-alone supply, return and exhaust fans shall comply with Section C406.2.3.

C406.2.1 HVAC system selection. Equipment installed shall be types that are listed in Tables C403.3.2(1) through C403.3.2(12) or a combination thereof. Electric resistance heating does not meet this requirement.

Exception: Allowed equipment not listed in Tables C403.3.2(1) through C403.3.2(12):

1. Air-to-water heat pumps.

2. Heat recovery chillers.

C406.2.2 Minimum equipment efficiency. Equipment shall exceed the minimum efficiency requirements listed in Tables C403.3.2(1) through C403.3.2(12) by 15 percent, in addition to the requirements of Section C403. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 15 percent.

Exceptions:

1. Equipment that is larger than the maximum capacity range indicated in Tables C403.3.2(1) through C403.3.2(12) shall utilize the values listed for the largest capacity equipment for the associated equipment type shown in the table.

2. Equipment complying with the exception to Section C406.2.1 is not required to comply with the minimum equipment efficiency requirement.

3. Compliance may be demonstrated by calculating a total weighted average percentage for all heating and cooling equipment combined. All equipment shall have efficiency that is no less than 5 percent better than the minimum required efficiency in Tables C403.3.2(1) through C403.3.2(12), and the resulting weighted average percentage for all equipment performance requirements shall exceed 15 percent. Calculation shall include heating and cooling capacities for all equipment, percentage better or worse than minimum required efficiency per Tables C403.3.2(1) through C403.3.2(12) for each performance requirement (SEER, EER/IEER, COP, HSPF, Et, Ec and AFUE), and the total weighted average efficiency percentage.

4. Hot water boilers with input capacity greater than 2,500,000 Btu/h shall be considered to comply with this section with a minimum thermal efficiency of 95 percent Et per the test procedure in 10 CFR Part 431.

C406.2.3 Minimum fan efficiency. Stand-alone supply, return and exhaust fans designed for operating with motors over 750 watts (1 hp) shall have a fan efficiency grade of not less than FEG 71 as defined in AMCA 205. The total efficiency of the fan at the design point of operation shall be within 10 percentage points of either the maximum total efficiency of the fan or the static efficiency of the fan.

C406.3 Reduced lighting power. Interior lighting within the whole building, building addition or tenant space shall comply with Section C406.3.1 or C406.3.2. Dwelling units and sleeping units within the building shall comply with Section C406.3.3.

C406.3.1 Reduced lighting power option 1. The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 90 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or by using 90 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

C406.3.2 Reduced lighting power option 2. The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 80 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or by using 80 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

C406.3.3 Lamp fraction. No less than 95 percent of the permanently installed light fixtures in dwelling units and sleeping units shall be provided by high efficacy lamps with a minimum efficacy of 65 lumens per watt.

C406.4 Enhanced digital lighting controls. No less than 90 percent of the total installed interior lighting power within the whole building, building addition or tenant space shall comply with Section C406.4.1.

C406.4.1 Lighting controls function. Interior lighting shall be located, scheduled and operated in accordance with Section C405.2, and shall be configured with the following enhanced control functions:

1. Luminaires shall be configured for continuous dimming.

2. Each luminaire shall be individually addressed.

Exceptions to Item 2:

1. Multiple luminaires mounted on no more than 12 linear feet of a single lighting track and addressed as a single luminaire.

2. Multiple linear luminaires that are ganged together to create the appearance of a single longer fixture and addressed as a single luminaire, where the total length of the combined luminaires is not more than 12 feet.

3. No more than eight luminaires within a daylight zone are permitted to be controlled by a single daylight responsive control.

4. Luminaires shall be controlled by a digital control system configured with the following capabilities:

4.1. Scheduling and illumination levels of individual luminaires and groups of luminaires are capable of being reconfigured through the system.

4.2. Load shedding.

4.3. In open and enclosed offices, the illumination level of overhead general illumination luminaires are configured to be individually adjusted by occupants.

4.4. Occupancy sensors and daylight responsive controls are capable of being reconfigured through the system.

5. Construction documents shall include submittal of a Sequence of Operations, including a specification outlining each of the functions required by this section.

C406.5 On-site renewable energy. A whole building, building addition or tenant space shall be provided with on-site renewable energy systems with an annual production per square foot of no less than the value specified in Table

C406.5 based on the total conditioned floor area of the whole building. The on-site renewable used in this option shall be separate from on-site renewables used as part of Section C406.7 or used to qualify for any exception in this code.

TABLE C406.5
ON-SITE RENEWABLE ENERGY SYSTEM RATING
(PER SQUARE FOOT)

Building Area Type	kBTU per year	kWh per year
Assembly	1.8	0.53
Dining	10.7	3.14
Hospital	3.6	1.06
Hotel/Motel	2.0	0.59
Multi-family residential	0.50	0.15
Office	0.82	0.24
Other	2.02	0.59
Retail	1.31	0.38
School/University	1.17	0.34
Supermarket	5.0	1.47
Warehouse	0.43	0.13

C406.6 Dedicated outdoor air system (DOAS). No less than 90 percent of the total conditioned floor area of the whole building, building addition or tenant space, excluding floor area of unoccupied spaces that do not require ventilation per the International Mechanical Code, shall be served by DOAS installed in accordance with Section C403.3.5. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.

C406.7 High performance dedicated outdoor air system (DOAS). A whole building, building addition or tenant space which includes a DOAS complying with Section C406.6 shall also provide minimum sensible effectiveness of heat recovery of 80 percent and DOAS total combined fan power less than 0.5 W/cfm of outdoor air. For the purposes of this section, total combined fan power includes all supply, exhaust, recirculation and other fans utilized for the purpose of ventilation.

C406.8 Reduced energy use in service water heating. Buildings with service hot water heating equipment that serves the whole building, building addition or tenant space shall comply with Sections C406.8.1 and C406.8.2.

C406.8.1 Building type. Not less than 90 percent of the conditioned floor area of the whole building, building addition or tenant space shall be of the following types:

1. Group R-1: Boarding houses, hotels or motels.

2. Group I-2: Hospitals, psychiatric hospitals and nursing homes.

3. Group A-2: Restaurants and banquet halls or buildings containing food preparation areas.

4. Group F: Laundries.

5. Group R-2.

6. Group A-3: Health clubs and spas.

7. Buildings with a service hot water load of 10 percent or more of total building energy loads, as shown with an energy analysis as described in Section C407 or as shown through alternate service hot water load calculations showing a minimum service water energy use of 15 k/Btu per square foot per year, as approved by the building official.

C406.8.2 Load fraction. Not less than 60 percent of the annual service hot water heating energy use, or not less than 100 percent of the annual service hot water heating energy use in buildings with water-cooled systems subject to the requirements of Section C403.9.5 or qualifying for one of its exceptions, shall be provided by one or more of the following:

1. Service hot water system delivering heating requirements using heat pump technology with a minimum COP of 3.0. For air-source equipment, the COP rating will be reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (15.6°C) or lower. For water-source equipment, the COP rating will be reported at the design leaving load water temperature with an entering water temperature of 74°F (23.3°C) or lower.

2. Waste heat recovery from service hot water, heat recovery chillers, building equipment, process equipment, or other approved system. Qualifying heat recovery must be above and beyond heat recovery required by other sections of this code.

3. On site renewable energy water-heating systems.

C406.9 High performance service water heating in multifamily buildings. For a whole building, building addition, or tenant space with not less than 90 percent of the conditioned floor area being Group R-2 occupancy, not less than 90 percent of the annual building service hot water energy use shall be provided by a heat pump system with a minimum COP of 3.0. This efficiency package is allowed be taken in addition to Section C406.8.2.

C406.10 Enhanced envelope performance. The Proposed Total UA of the thermal envelope of the whole building or building addition shall be 15 percent lower than the Allowable Total UA for an area of identical configuration and fenestration area in accordance with Section C402.1.5 and Equation 4-2.

C406.11 Reduced air infiltration. Measured air infiltration of the total conditioned floor area of the whole building, fully isolated building addition or tenant space shall comply with Section C406.11.1.

C406.11.1 Air leakage testing and verification. Air infiltration shall be verified by whole building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air leakage rate of the building envelope shall not exceed 0.17 cfm/ft2 under a pressure differential of 0.3 in. water (75 Pa), with the calculated surface area being the sum of the above and below grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories

above grade, and leakage rates shall be submitted to the code official and the building owner.

Exception: Where the conditioned floor area of the building is not less than 250,000 ft2 (25,000 m2), air leakage testing shall be permitted to be conducted on representative above grade sections of the building provided the conditioned floor area of tested areas is no less than 25 percent of the conditioned floor area of the building and are tested in accordance with this section.

C406.12 Enhanced commercial kitchen equipment. For buildings and spaces designated as Group A-2, or facilities whose primary business type involves the use of a commercial kitchen with at least one gas or electric fryer, all fryers, dishwashers, steam cookers and ovens shall comply with all of the following:

1. Achieve the ENERGY STAR label in accordance with the specifications current as of January 1, 2018.

2. Be installed prior to the issuance of the certificate of occupancy.

3. Have the ENERGY STAR qualified model number listed on the construction documents submitted for permitting.

Purpose of code change:

This proposal begins to remedy conflicting provisions in the WSEC-C that are preempted by federal law (EPCA).

Section C406 (required additional energy efficiency credits) of the 2021 WSEC-C was completely rewritten to prohibit and penalize covered products (42 U.S.C. § 6295) in direct violation with the EPCA. Due to the length, complexity, and intricacies of the energy efficiency credit system the fastest method to begin remedying conflicting provisions within this section of the WSEC-C is to revert completely back to the language contained within the 2018 WSEC-C.

For any covered product, "EPCA, 42 U.S.C. § 6297(c), expressly preempts State and local regulations concerning the energy use" California Restaurant Ass'n v. City of Berkeley (9th Cir. 2023).

Your amendment must meet one of the following criteria. Select at least one:

- ☐ Addresses a critical life/safety need.
- ☐ The amendment clarifies the intent or application of the code.
- ☐ Addresses a specific state policy or statute. (Note that energy conservation is a state policy)
- ☒ Consistency with state or federal regulations.
- ☐ Addresses a unique character of the state.
- ☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

- ☐ Single family/duplex/townhome
- ☐ Multi-family 1 – 3 stories
- ☒ Multi-family 4 + stories
- ☒ Commercial / Retail
- ☒ Institutional
- ☒ Industrial

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Economic Impact Data Sheet

Is there an economic impact: ☐ Yes ☒ No

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants, and businesses. If you answered "No" above, explain your reasoning.

In reference to the currently in force 2018 WSEC-C, there is zero economic impact as this proposal rolls back changes that the 2021 WSEC-C would have imposed. This proposal averts any cost increases that this section of the 2021 WESC-C would have created.

Provide your best estimate of the **construction cost** (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)

$0 /square foot (For residential projects, also provide **$0 / dwelling unit**)

Show calculations here, and list sources for costs/savings, or attach backup data pages

Provide your best estimate of the **annual energy savings** (or additional energy use) for your code change proposal?

0 KWH/ square foot (or) **0 KBTU/ square foot**

(For residential projects, also provide **0 KWH/KBTU / dwelling unit**)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

In reference to the currently in force 2018 WSEC-C, there is zero energy impact as this proposal rolls back changes that the 2021 WSEC-C would have imposed.

List any **code enforcement** time for additional plan review or inspections that your proposal will require, in hours per permit application:

Zero impact to plan review or inspection time or process.

Small Business Impact. Describe economic impacts to small businesses:

This proposal averts any cost increases that this section of the 2021 WESC-C would have created. Zero small business impact in relation to the currently in force 2018 WSEC-C.

Housing Affordability. Describe economic impacts on housing affordability:

This proposal averts any cost increases that this section of the 2021 WESC-C would have created. Zero housing affordability impact in relation to the currently in force 2018 WSEC-C.

Other. Describe other qualitative cost and benefits to owners, to occupants, to the public, to the environment, and to other stakeholders that have not yet been discussed:

Reduces legal risk and uncertainty to building officials, municipalities, and the state related to conflicting provisions in this code that are preempted by federal law.